

# HOUSTON IS INVESTING IN WASTEWATER INFRASTRUCTURE – WASTEWATER CONSENT DECREE UPDATE



**HOUSTON  
PUBLIC WORKS**

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**OCTOBER 29, 2024**



# PURPOSE

together we create a strong foundation  
for Houston to thrive

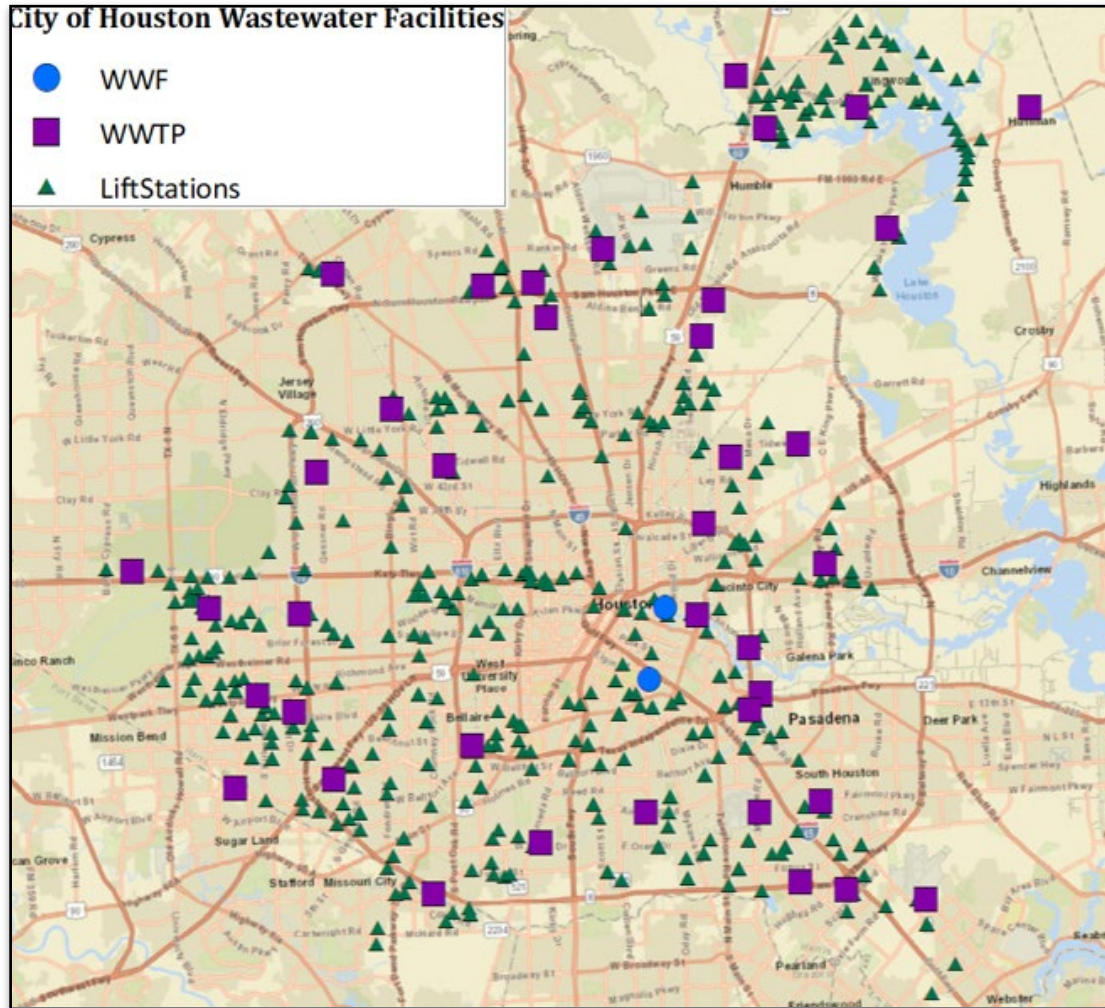
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# 5 TO THRIVE VALUES

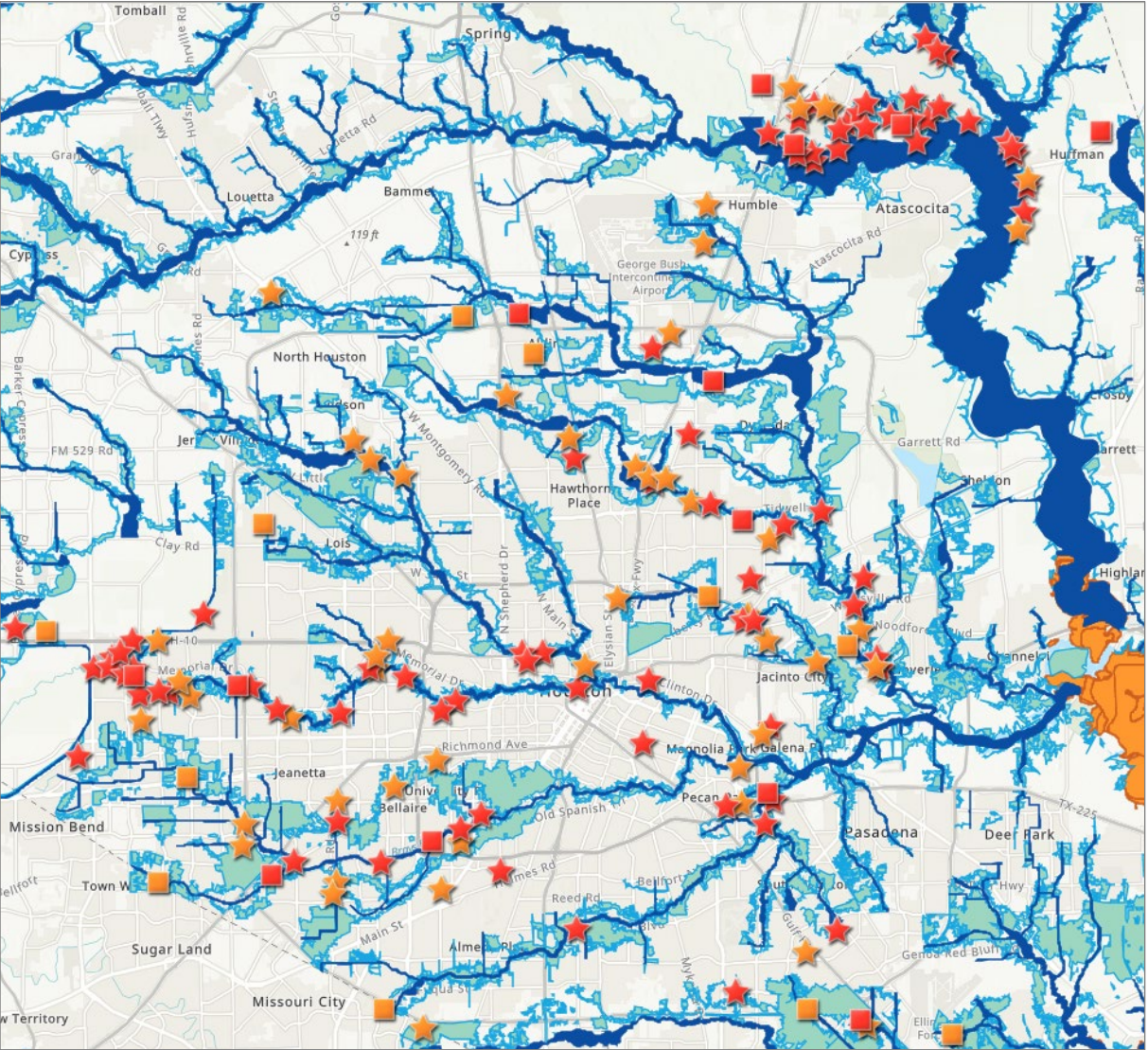
respect | ownership | communication | integrity | teamwork

# HOUSTON'S WASTEWATER INFRASTRUCTURE



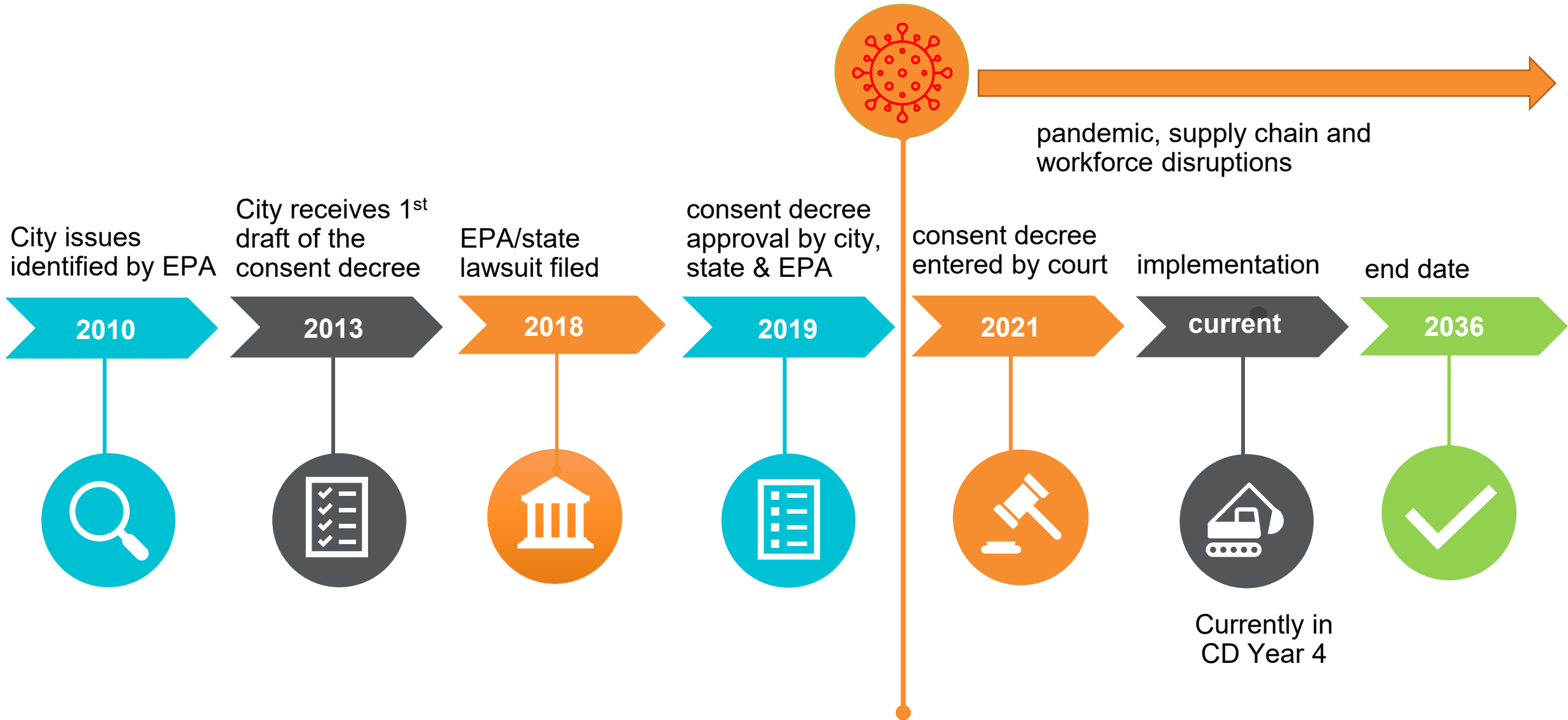
- 38 Wastewater Treatment Plants (WWTP) – 564 MGD
- 2 Wet Weather Facilities (WWF)
- 374 Lift Stations (LS)
- 5,791 Miles | Gravity Sewer
- 304 Miles | Force Mains (FM)
- 134,772 Manholes
- 500,000 Service Connections

# HOUSTON'S CHALLENGES



- Unstable Soils
- High Annual Rainfall
- Topography and Drainage
- Aging Infrastructure
- Shallow Depth of Sewers
- Sub-standard Pipe Slopes
- Backlot Sewers
- Lift Stations in Floodplain
- WWTPs in Floodplain

# ACTIVITY TIMELINE





# HOUSTON'S CONSENT DECREE IS AN INVESTMENT IN THE CITY'S SEWER SYSTEM

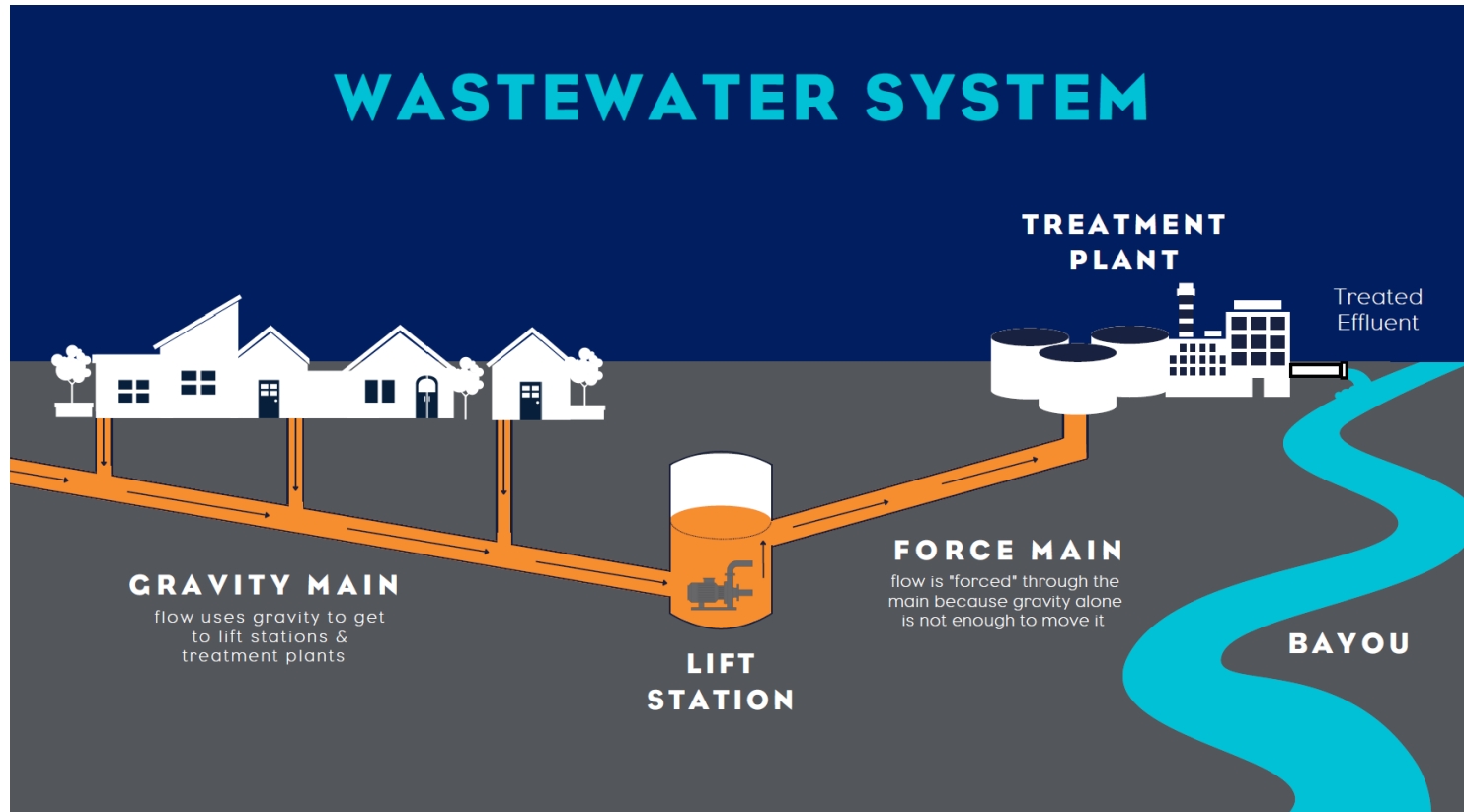
**On April 1, 2021, the U.S. District Court for the Southern District of Texas approved a consent decree between the City of Houston, the United States Environmental Protection Agency (EPA) and the State of Texas to improve Houston's wastewater system.**

The objective is to improve system performance, achieve better compliance, and protect public health and the environment.

The Plan Includes:

- Upgrading and improving the wastewater collection and treatment system
- Fix aging infrastructure
- Early action projects
- Capacity Assessment and Remediation
- Capacity Maintenance Operations and Maintenance (CMOM)
- Advanced Sewer System Monitoring

# HOW A WASTEWATER SYSTEM WORKS



- Wastewater is collected from homes and businesses and sent to a **Wastewater Treatment plant (WWTP)**. Once there, contaminants are removed and clean water is released back into the environment.
- Houston's wastewater system uses hundreds of lift stations to move wastewater to treatment plants due to the city's flat topography. This makes it more likely for pipes to experience blockages.



# HOUSTON'S SEPARATE SANITARY SEWER SYSTEM IS THE LARGEST AND MOST COMPLEX IN THE NATION

## Wastewater System Issues

### Sanitary Sewer Overflows (SSO)

- An **SSO** occurs when there is a blockage in the collection system, backing up the flow of wastewater to the treatment plant, causing it to spill out.
- **SSOs** are primarily caused by customers that improperly dispose of fats, oil and grease (**FOG**) and rags/wipes into the City's sewer system.

### Effluent Violations

- Treated effluent (*aka treated wastewater released into the environment*) from a **WWTP** exceeds permit limits for certain parameter(s).

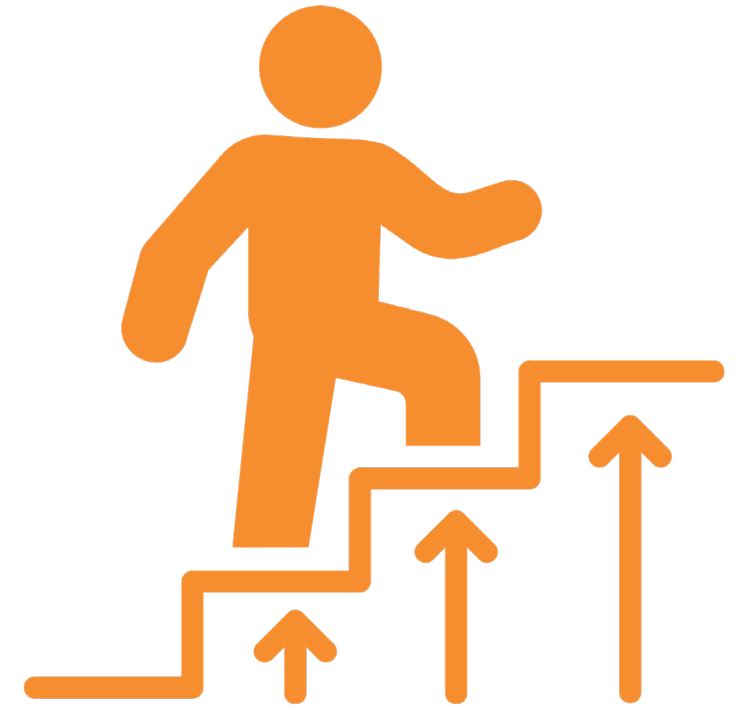


Sanitary Sewer Overflow (**SSO**)

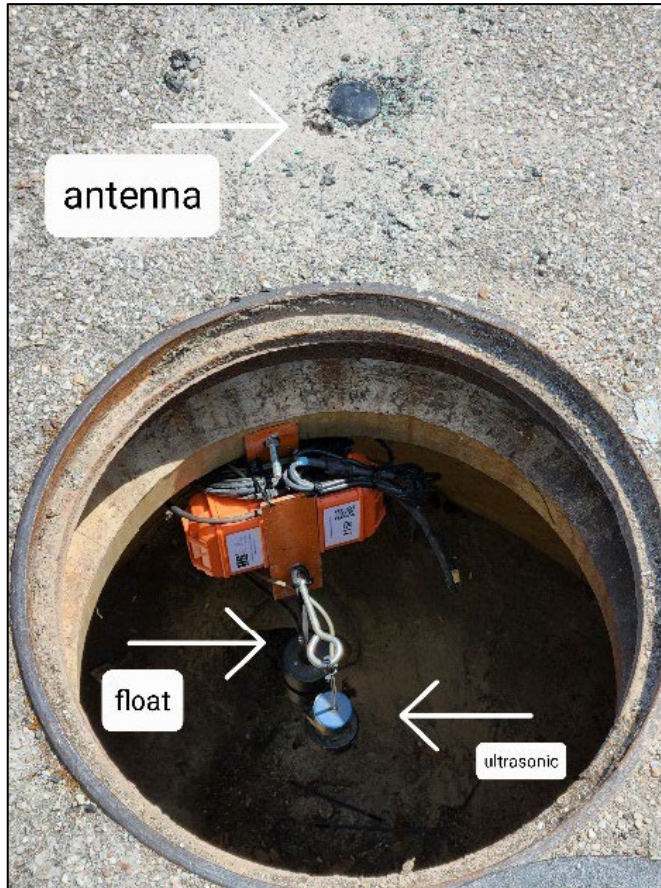


# PROGRESS (CONTINUED)

CONSENT DECREE COMPONENT	KEY SCOPE OF WORK	PROGRESS
Improve Wet Weather Flow Treatment	Pilot study of new treatment technologies	On Schedule.
Advanced Sewer System Monitoring	Install 3,000 new “smart” manhole monitors	Ahead of Schedule. (see next slide)



# SSO PREVENTION - ADVANCED SEWER SYSTEM MANHOLE MONITORS



- ✓ Generates an alert to 311 system when algorithm detects a possible blockage.
- ✓ A Service Request is created in the Infor Work Management System.
- ✓ Wastewater inspector arrives on site to investigate and create work orders for Stoppage Clearance crew to clear blockage.
- ✓ Blockage is cleared preventing an SSO.
- ✓ **665 potential SSOs prevented thus far.**



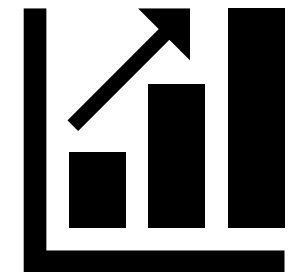
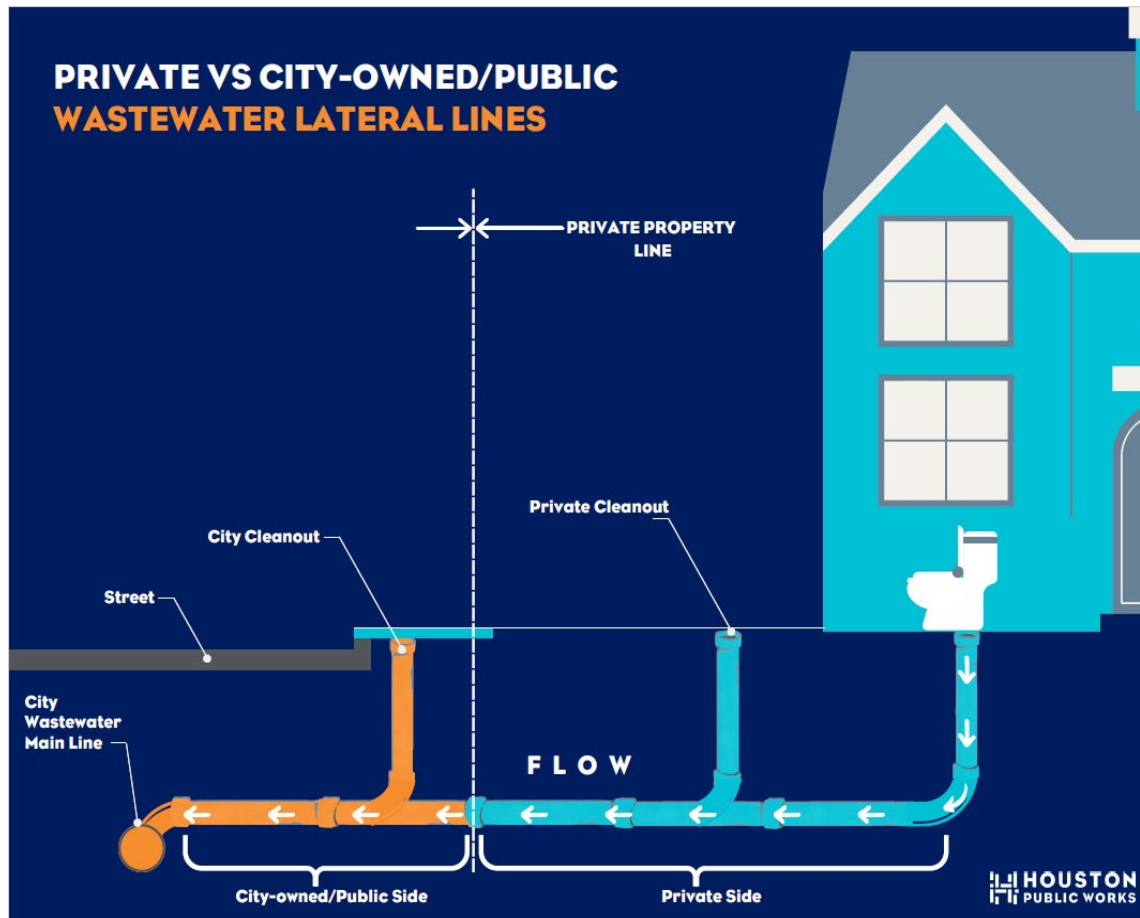
# RESULTS

- 63 Contractors/Consultants/Vendors currently working on 95 Active CD contracts.
- 41% reduction in dry weather SSOs on gravity mains when comparing to beginning of CD.
- Use of AI & smart manhole technology has helped HPW save staff hours.
  - Over 10,000 hrs. saved in sewer inspections.
  - Over 21,000 hrs. saved in manhole inspections.
  - 2,884 hrs. avoided in SSO related sewer blockage clearance and cleanup activities.
  - Increased productivity, data accuracy and accessibility.
  - Saved \$477,700 from SSO cleanup efforts and stipulated penalties

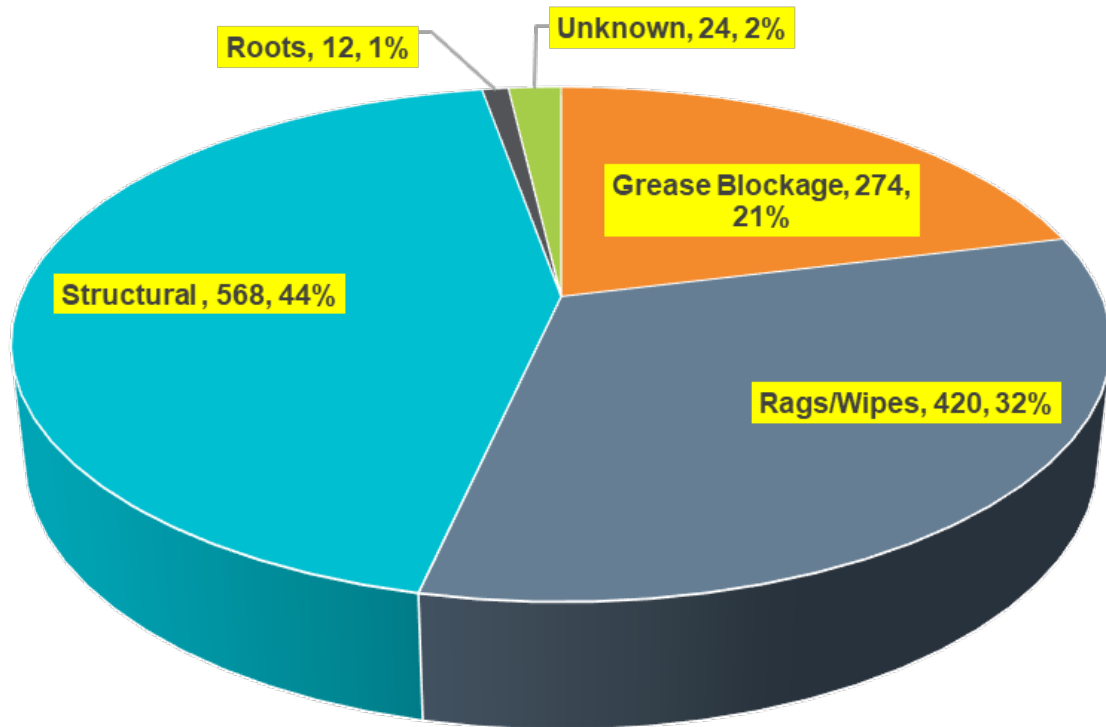


# ONGOING CHALLENGES

- While we have seen an overall decrease in SSOs since the start of the CD, we are noticing an increase in SSOs related to **service laterals**
- Many of these are preventable and are caused by Fats, Oils, and Grease or Rags/Wipes and other non-degradable items coming from single-family homes or apartment complexes



# SEWER OVERFLOWS IN SERVICE LATERALS BY CAUSE



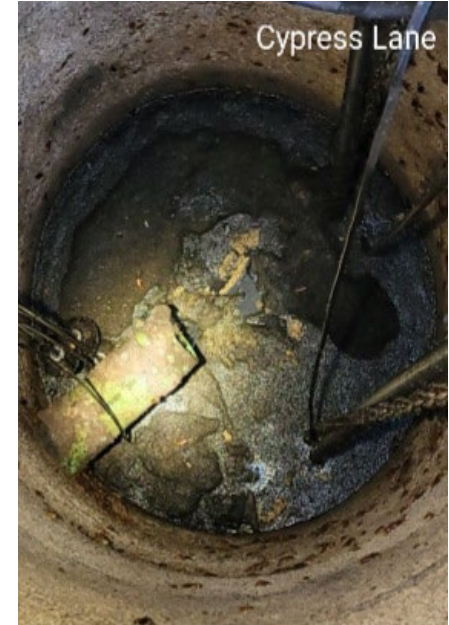
Cause	Possible Actions
Structural	<ul style="list-style-type: none"> <li>Heat Map Analysis</li> <li>Prioritize Inspection</li> <li>Structural Remediation</li> </ul>
Grease	<ul style="list-style-type: none"> <li>Heat Map Analysis</li> <li>Targeted Education Outreach (HHD &amp; HPW)</li> <li>Enforcement (HHD)</li> <li>CCTV for any possible structural remediation</li> </ul>
Rags/Wipes	<ul style="list-style-type: none"> <li>Heat Map Analysis</li> <li>Targeted Education Outreach (HHD &amp; HPW)</li> <li>Enforcement (HHD)</li> <li>CCTV for any possible structural remediation</li> </ul>
Roots	<ul style="list-style-type: none"> <li>Structural (Point Repair)</li> </ul>



# WASTEWATER COLLECTION SYSTEM – BLOCKAGES



# INSIDE LIFT STATIONS AND TREATMENT PLANTS



# INSIDE LIFT STATIONS AND TREATMENT PLANTS







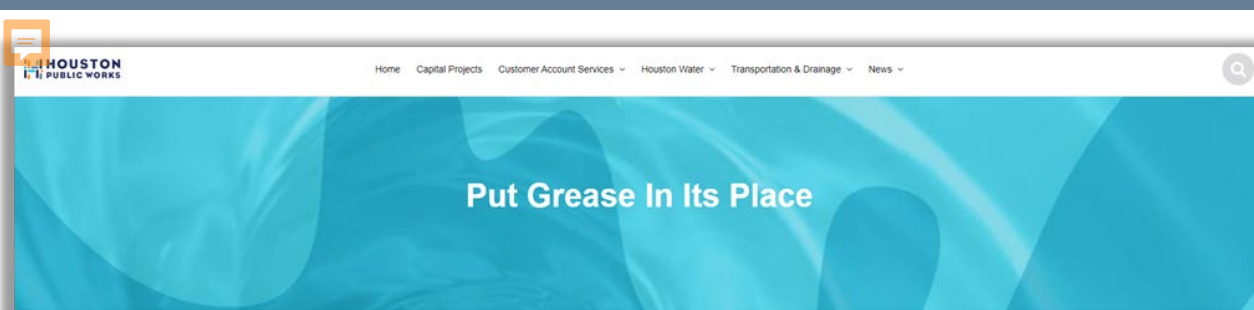
# ADDITIONAL CHALLENGES

- Workforce shortages (HPW, Contractors and Health Department-FOG program)
- Post COVID-19/Supply Chain disruptions (related delays set us back in Capital Improvement Projects)
- Inflow and Infiltration continues to cause problems during wet weather (CRMP provides long-term solutions but I/I reduction is still necessary)
- Access to sewer lines and manholes that run through private property (locked gates, structures built over manholes, residents refusing access)

# TAKEAWAYS FOR THE B.I.G. TEAM

- Significant progress has been made in addressing SSOs and Effluent Violations, though much more work needs to be done.
- The majority of SSOs are caused by FOG & rags/wipes that customers improperly dispose of in the sewer system.
- **How you can help:**
  - Encourage residents to properly dispose of FOG and avoid flushing non-degradable items, and promptly fix broken sewer lines or improper connections
  - Promote the Protect Our Pipes campaign: [www.protectourpipes.org](http://www.protectourpipes.org)





**Protect Our Pipes**

70% of sewer overflows in Houston are caused by clogs from fats, oils and grease poured down the drain and wipes flushed down toilets. Sewer overflows can cost thousands of dollars to repair, harm our health, and pollute the environment. Protect our pipes, put grease in its place & prevent sewer overflows through these easy steps!

From Turkey to Tamales.  
**MAKE PEACE WITH GREASE THIS HOLIDAY SEASON**

**POUR** **COOL** **TOSS**

**Help Prevent Sewer Overflows During the Holidays and Beyond**

Each year, when temperatures decrease, Houston Public Works responds to twice as many sewer overflows due to blockages caused by grease, oils, and fats. We attribute this to two main causes:

- During the holiday season there is a significant increase in cooking large meals for family and friends. As a result, more grease is generated compared to other times in the year.
- The colder weather causes grease to quickly solidify while in the pipes. This means that even a little bit of grease poured down your drain can cause a bigger issue.

The Digital Toolkit linked below provides resources to engage and educate all Houstonians on how to prevent blockages and sewer overflows. The materials are an aggregate of resources you can use for websites, emails, newsletters, news stories, and blog posts. Please share this valuable content with your community and help Houston remain strong and vibrant.

[Protect Our Pipes Winter 2022 Digital Toolkit](#)

[Protect Our Pipes Holiday Recipe Card](#)

# PROTECT OUR PIPES

## DIGITAL TOOLKIT FOR PARTNERS

### DO YOUR PART TO PROTECT OUR PIPES!

In Houston, 70% of sanitary sewer overflows (SSOs) are caused by clogs from fats, oils and grease (FOG) that are poured down the drain and wipes flushed down toilets. This often causes untreated wastewater to back up into our streets and homes, harming the environment and our health.

Each year, when temperatures decrease, Houston Public Works responds to twice as many SSOs due to blockages caused by grease, oils, and fats. We attribute this to two main causes:

- During the holiday season there is a significant increase in cooking large meals for family and friends. As a result, more grease is generated compared to other times in the year.
- The colder weather causes grease to quickly solidify while in the pipes. This means that even a little bit of grease poured down your drain can cause a bigger issue.

### HOW TO PREVENT SSOs DURING THE HOLIDAYS AND BEYOND

Whether you are cooking tamales or turkeys, it is important to remember to put grease in its place – the trash. Follow these three easy steps:

1. Pour fats, oils and grease into a safe container
2. Cool in the fridge
3. Toss in the trash

And remember – only flush the 3 P's: Pee, Poo and (Toilet) Paper! Wipes clog pipes!



### RESOURCES

Protect Our Pipes characters, Sammy, Ruby and Martin, offer additional tools to help Protect Our Pipes:

#### Videos

- [PSA Video](#) – embed in your Newsletter, share on website
- [5 second Video](#) – post on social media
- Additional videos on [Houston Public Work's YouTube Page](#).

#### Graphics & Social Media

Print and hand out or hang up in your community

- [Flyer/Poster](#) (English and Spanish)
- Protect Our Pipes Infographic- [English](#) / [Spanish](#)
- Protect Our Pipes Frequently Asked Questions- [English](#) / [Spanish](#)
- Protect Our Pipes [Bathroom Stall Sign](#)
- Protect Our Pipes translated resources- [Spanish](#) / [Mandarin](#) / [Vietnamese](#) / [Arabic](#)
- Follow us on [Facebook](#) and [Twitter](#) for social media posts to share and retweet

**Want to Request a Presentation?**





# PROTECT OUR PIPES CAMPAIGN



**HOUSTON PUBLIC WORKS**

**PROTECT OUR PIPES**  
Help keep fats, oils, grease, and other items from going down the drain.

PREP TIME: 5MIN TOTAL TIME: 15MIN SERVES: 8 PEOPLE

**EASY STUFFING RECIPE**

**Step 1:** Heat 1 3/4 cups of chicken broth, 1 stalk of celery, and 1 small onion in a 2-quart saucepan over medium-high heat to a boil. Reduce the heat to low.

**Step 2:** Cover and cook for 5 minutes or until the vegetables are tender. Remove the saucepan from the heat.

**Step 3:** Add 4 cups of your favorite stuffing mix or old toasted bread crumbs and stir until coated.

**Step 4:** Eat and enjoy!

**Step 5:** Remember to dispose of all cooking waste in the trash and never down the drain! Follow the easy steps on the back of this card.

LEARN MORE AT [ProtectOurPipes.org](https://ProtectOurPipes.org)

Flushable wipe video

- In 2023, Houston Water attended 41 events with an estimated reach of 55k people
- Over 100k Protect Our Pipes mailers sent since 2020
- Social media reach since 2020 is an estimated 300k impressions
- Radio ads reached 2.6 million since 2020
- TV ads reached 32 million since 2020
- Google, Airport ads each reached 1 million since 2020
- Gas station ad reached 250k since 2020
- Working on a partnership with Rodeo Houston

# Thank you!



[HoustonPublicWorks.org](https://HoustonPublicWorks.org)



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